

REMARKS/ARGUMENTS:

Claims 53, 54, 96, 97, 127, and 128 are canceled without prejudice. Claims 37, 62, and 113 are amended. Support for the amendments to claims 37, 62, and 113 can be found in the Applicant's specification at p. 12, line 21-p. 13, line 2, Table 1 at p. 13, and Table 13 at p. 24. Reexamination and reconsideration of the application, as amended, are respectfully requested.

The present invention relates to a manufacturing process for an organic EL (electroluminescence) element, an electrically light-emitting element that may be used in displays, display light sources, and the like. In particular, it relates to a composition for use as a hole injecting and transporting layer suitable for ink jet patterning. (Applicant's specification, at p. 1, lines 8-14).

INFORMATION DISCLOSURE STATEMENT:

The Office states that the information referred to in the information disclosure statement filed 10/4/2004 has not been considered since only an abstract and not a complete copy of the article was submitted. In response, a complete copy of the article is submitted concurrently herewith.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103:

Claims 113-127 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nagayama et al. (U.S. Patent No. 5,701,055) in view of Woo et al. (U.S. Patent No. 6,169,163). This rejection is moot with respect to claim 127 due to the cancellation of this claim. The Applicant respectfully traverses this rejection as to claims 113-126. Claim 113, as amended, is as follows:

An organic EL element, having a stacked structure including a hole injecting or transporting layer and a light-emitting layer formed within a partitioning member which is divided into individual pixel areas, manufactured by a manufacturing process, comprising:

forming a plurality of anode layers

forming the partitioning member over a substrate, the partitioning member lying at least between adjacent ones of the plurality of anode layers so as to independently partition the adjacent ones of the plurality of anode layers, whereby a plurality of openings are formed over at least a portion of an anode layer, the openings corresponding to the pixel areas; wherein a side of the partitioning member contacts the substrate, wherein a second side of said partitioning member contacts an anode layer, and wherein said anode layer contacts said substrate

forming a hole injecting or transporting layer by independently filling each of the openings with a composition for the hole injecting or transporting layer using an ink-jet head, the composition comprising (1) a conductive material containing copper phthalocyanine, and (2) a solvent;

drying the composition filled in the openings to form the hole injecting or transporting layer; and

independently filling each of the openings with a light-emitting layer composition over the hole injecting or transporting layer using an ink-jet head to form the light-emitting layer, wherein a height of the hole injecting or transporting layer and the light-emitting layer is less than that of the partitioning member;

forming a cathode layer over the light-emitting layer, wherein a film thickness of the hole injecting or transporting layer is 0.1 μ m or less, wherein a film resistance of the hole injecting or transporting layer is in the range $0.5 \times 10^9 \Omega/\text{m}^2$ to $5 \times 10^9 \Omega/\text{m}^2$.

Claim 113 was amended to include the limitations of canceled claims 127 and 128. Claims 54, 97, and 128 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nagayama, Woo, Jonas '515, Taniguchi et al. (U.S. Patent No. 5,667,572), and Roitman (U.S. Patent No. 5,972,419) and further in view of Jonas (U.S. Patent No. 6,004,483, hereafter Jonas '483).

Applicant respectfully submits that the cited references cannot render claim 113 obvious because the cited references fail to teach or suggest "wherein a film thickness of the hole injecting or transporting layer is 0.1 μ m or less, wherein a film resistance of the hole injecting or transporting layer is in the range $0.5 \times 10^9 \Omega/\text{m}^2$ to $5 \times 10^9 \Omega/\text{m}^2$ ".

Nagayama, Woo, Jonas '515, Taniguchi, and Roitman do not explicitly teach surface resistances within the Applicant's claimed range and are not relied upon by the Office for such. Instead, the Office cites Jonas '483 for teaching that polythiophene films similar to Jonas '515 can be printed with resistances of 10^{10} to 0.1 ohm/square.

The Office states,

"Jonas '483 indicates similar polythiophene films to Jonas '515 can be printed with surface resistances of 10^{10} to 0.1 ohm/square (col. 4, lines 35-36) which overlaps Applicant's claimed range. The subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because

overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549.”

The Applicant respectfully disagrees. Jonas '483 teaches a very broad range of which only a small portion is claimed by the present invention. That is, from 0.1 ohm/square to 0.5×10^9 ohm/square lies outside of the range claimed by the present invention. More importantly, resistances that are outside of the range claimed by the present invention do not offer the favorable light-emission characteristics taught by the present invention. The Applicant's specification at p. 11, lines 7-16, states,

“The organic EL element which pertains to the present invention is manufactured through the foregoing process, and the film thickness of the hole injecting and transporting layer is 0.1 μm or less. The film resistance of the hole injecting and transporting layer is in the range $0.5 \times 10^9 \Omega/\text{m}^2$ to $5 \times 10^9 \Omega/\text{m}^2$. By establishing the film thickness and the film resistance of the hole injecting and transporting layer within the preceding ranges, the light-emission characteristics of the organic EL element can be improved.”

Luminance values found in Table 13 at p. 24 of the Applicant's specification are the most favorable when the resistances are within the claimed range, thus demonstrating the criticality of the claimed range.

“Applicants can rebut a *prima facie* case of obviousness based on overlapping ranges by showing the criticality of the claimed range. The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the

claimed range achieves unexpected results relative to the prior art range.” MPEP 2144.05

According to Table 13, resistances that are outside of the Applicant's claimed narrow range but within Jonas '483 much broader range give inferior luminance values. Thus, the claimed range achieves unexpected results relative to the prior art.

In light of the foregoing, Applicant respectfully submits that the cited references could not have rendered amended claim 113 obvious, because the combination of references fails to teach or suggest each and every claim limitation. Claims 114-126 depend from claim 113 and as such include all the limitations of amended claim 113, and therefore, cannot be made obvious for at least the same reasons as claim 113. Withdrawal of these rejections is thus respectfully requested.

Claims 37-49, 51, 53, 62, 64, 66, 83-96, and 113-127 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nagayama in view of Woo, as applied to claim 113, above, and further in view of Jonas (U.S. Patent No. 5,766,515, hereafter Jonas '515), Taniguchi et al. (U.S. Patent No. 5,667,572), and Roitman (U.S. Patent No. 5,972,419). This rejection is moot with respect to claims 53, 96, and 127 due to the cancellation of these claims. The Applicant respectfully traverses this rejection as to claims 37-49, 51, 62, 64, 66, 83-95, and 113-126.

Claims 37-49, 51, 62, 64, 66, 83-95, and 113-126 require a film thickness of the hole injecting or transporting layer to be 0.1 μ m or less, and a film resistance of the hole injecting or transporting layer to be in the range 0.5 x 10⁹ Ω /m² to 5 x 10⁹ Ω /m². Consequently, claims 37-49, 51, 62, 64, 66, 83-95, and 113-126 are patentable over the cited references, as well as Jonas '483 for the reasons discussed above.

In light of the foregoing, Applicant respectfully submits that the cited references could not have rendered claims 37-49, 51, 62, 64, 66, 83-95, and 113-126

obvious because the cited references fail to teach or suggest each and every claim limitation. Withdrawal of this rejection is thus respectfully requested.

Claims 54, 97, and 128 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nagayama, Woo, Jonas '515, Taniguchi, and Roitman as applied to claims 37, 62, and 113, above, and further in view of Jonas (U.S. Patent No. 6,004,483, hereafter Jonas '483). This rejection is moot due to the cancellation of these claims.

Applicant believes the foregoing amendments comply with requirements of form and thus may be admitted under 37 C.F.R. § 1.116(b). Alternatively, if these amendments are deemed to touch the merits, admission is requested under 37 C.F.R. § 1.116(c). In this connection, these amendments were not earlier presented because they are in response to the matters pointed out for the first time in the Final Office Action.

Lastly, admission is requested under 37 C.F.R. § 1.116(b) as presenting rejected claims in better form for consideration on appeal.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6809 to discuss the steps necessary for placing the application in condition for allowance.

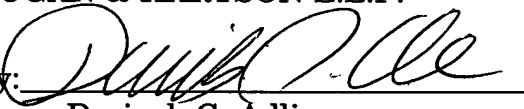
Appl. No. 09/297,483
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If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
HOGAN & HARTSON L.L.P.

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